



UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office

NOTICE OF ALLOWANCE AND ISSUE FEE DUE

MMC:2/0312

JASON Z LIN  
19597 VIA MONTE DRIVE  
SARATOGA CA 95070

| APPLICATION NO.       | FILING DATE | TOTAL CLAIMS              | EXAMINER AND GROUP ART UNIT | DATE MAILED   |
|-----------------------|-------------|---------------------------|-----------------------------|---------------|
| 09/653,496            | 08/31/00    | 005                       | THOMPSON, C                 | 2813 03/12/01 |
| First Named Applicant | CHIEN,      | 35 USC 154(b) term ext. = | 0 Days.                     |               |

TITLE OF INVENTION MANUFACTURING METHOD OF A GALLIUM NITRIDE-BASED BLUE LIGHT EMITTING DIODE (LED) OHMIC ELECTRODES

| ATTY'S DOCKET NO. | CLASS-SUBCLASS | BATCH NO. | APPLN. TYPE | SMALL ENTITY | FEES DUE | DATE DUE |
|-------------------|----------------|-----------|-------------|--------------|----------|----------|
| 3 UPA-00178       | 438-046.000    | D28       | UTILITY     | YES          | \$620.00 | 06/12/01 |

**THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT.  
PROSECUTION ON THE MERITS IS CLOSED.**

**THE ISSUE FEE MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS  
APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED.**

**HOW TO RESPOND TO THIS NOTICE:**

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

- A. If the status is changed, pay twice the amount of the FEE DUE shown above and notify the Patent and Trademark Office of the change in status, or
- B. If the status is the same, pay the FEE DUE shown above.

If the SMALL ENTITY is shown as NO:

- A. Pay FEE DUE shown above, or
- B. File verified statement of Small Entity Status before, or with, payment of 1/2 the FEE DUE shown above.

II. Part B-Issue Fee Transmittal should be completed and returned to the Patent and Trademark Office (PTO) with your ISSUE FEE. Even if the ISSUE FEE has already been paid by charge to deposit account, Part B Issue Fee Transmittal should be completed and returned. If you are charging the ISSUE FEE to your deposit account, section "4b" of Part B-Issue Fee Transmittal should be completed and an extra copy of the form should be submitted.

III. All communications regarding this application must give application number and batch number.

Please direct all communications prior to issuance to Box ISSUE FEE unless advised to the contrary.

**IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.**

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*for*  
**UNITED STATES DEPARTMENT OF COMMERCE**

**Patent and Trademark Office**

Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. |
|-----------------|-------------|----------------------|---------------------|
|-----------------|-------------|----------------------|---------------------|

09/653,496 08/31/00 CHIEN

F UPA-00178

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MMC2/0312

EXAMINER

THOMPSON, C

ART UNIT

PAPER NUMBER

2819

DATE MAILED:

03/12/01

Please find below and/or attached an Office communication concerning this application or proceeding.

**Commissioner of Patents and Trademarks**

|                               |                            |                     |  |
|-------------------------------|----------------------------|---------------------|--|
| <b>Notice of Allowability</b> | <b>Application No.</b>     | <b>Applicant(s)</b> |  |
|                               | 09/653,496                 | CHIEN ET AL.        |  |
|                               | Examiner<br>Craig Thompson | Art Unit<br>2813    |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance and Issue Fee Due or other appropriate communication will be mailed in due course. THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS. This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1.  This communication is responsive to IDS, Paper No. 2, filed 8/31/2000.
2.  The allowed claim(s) is/are 1-15.
3.  The drawings filed on 31 August 2000 are acceptable as formal drawings.
4.  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a)  All
  - b)  Some\*
  - c)  None
  1.  Certified copies of the priority documents have been received.
  2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3.  Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

5.  Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. THIS THREE-MONTH PERIOD IS NOT EXTENDABLE FOR SUBMITTING NEW FORMAL DRAWINGS, OR A SUBSTITUTE OATH OR DECLARATION. This three-month period for complying with the REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL is extendable under 37 CFR 1.136(a).

6.  Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient. A SUBSTITUTE OATH OR DECLARATION IS REQUIRED.
7.  Applicant MUST submit NEW FORMAL DRAWINGS
  - (a)  including changes required by the Notice of Draftsperson's Patent Drawing Review( PTO-948) attached
    - 1)  hereto or 2)  to Paper No. \_\_\_\_\_.
  - (b)  including changes required by the proposed drawing correction filed \_\_\_\_\_, which has been approved by the examiner.
  - (c)  including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No. \_\_\_\_\_.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings. The drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftsperson.

8.  Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Any reply to this letter should include, in the upper right hand corner, the APPLICATION NUMBER (SERIES CODE / SERIAL NUMBER). If applicant has received a Notice of Allowance and Issue Fee Due, the ISSUE BATCH NUMBER and DATE of the NOTICE OF ALLOWANCE should also be included.

#### Attachment(s)

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)<br><input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)<br><input checked="" type="checkbox"/> Information Disclosure Statements (PTO-1449), Paper No. 2.<br><input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material | <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)<br><input type="checkbox"/> Interview Summary (PTO-413), Paper No. _____.<br><input type="checkbox"/> Examiner's Amendment/Comment<br><input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance<br><input type="checkbox"/> Other |
|--|--|

### **EXAMINER'S AMENDMENT**

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Jason Z. Lin on 11 March 2001.

The application has been amended as follows:

- ✓ • In claim 1, line 9: "NiCr" has been deleted.  
✓ • In claim 3, line 3: "lin" has been deleted and --line-- has been substituted therefor.  
✓ • In claim 4, line 3: "th" has been deleted and --the-- has been substituted therefor.

### **REASONS FOR ALLOWANCE**

The following is an examiner's statement of reasons for allowance:  
prior art of record does not describe or suggest applicants' invention set forth in claims 1-5, a method of manufacturing gallium nitride based blue light emitting diodes ohmic electrodes wherein an alloy thin film is grown upon a P-type gallium nitride epitaxial layer, lift-off techniques are used to obtain a circular transmission line model pattern, and the alloy thin film is heat treated to obtain a better ohmic property, so that the contacting resistance between the alloy and the P type GaN epitaxial layer decreases the electrical resistance between the P-GaN epitaxial layer and N-GaN epitaxial layer and lowers the forward breakdown voltage of the LED.

Similarly prior art of record does not describe or suggest applicants' invention set forth in claims 6-15, wherein a GaN based blue LED transparent conductive layer is manufactured by growing an alloy film upon the P-type GaN epitaxial layer and heat treating the thin alloy to make the thin film transparent and to have a better ohmic property.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

*Cited Prior Art*

Nichia (Derwent abstracted of Japanese publication no. JP06232450A, application no. 1993JP-0039359) teaches forming a GaN compound semiconductor layer used in a blue light emitting diode incorporating p type doping on an electrode formed on a GaN compound, and annealing to 400 °C or more (Abstract). Sharp (Derwent abstracted of Japanese publication JP 11177134A, application no. 1997JP-0343524) teaches post-heat treatment of 700 °C for a GaN semiconductor layer, but teaches using lead electrodes. These references are deemed relevant to the current invention.

*Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Craig Thompson whose telephone number is (703)305-4789. The examiner can normally be reached on Monday-Friday from 8:00 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Bowers, can be reached at (703)308-2416. Fax numbers for the group include (703)305-3431 and (703)308-7722.

Any inquiry of a general nature relating to the status of this application should be directed to the group receptionist whose telephone number is (703)308-0956.

*Craig Thompson*

Craig Thompson  
9 March 2001

*Conclusion*

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*Charles D. Bowers Jr.*  
Charles Bowers  
**Supervisory Patent Examiner**  
Technology Center 2800

*Craig Thompson*  
Craig Thompson  
11 March 2001